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TRANSFERRING BEES TO MODERN HIVES

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Contribution from the Bureau of Entomology
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THE KEEPING OF BEES in box-hives or log "gums" is unprofitable. The care that bees need in order to gather a fair crop of honey can be given only if the beekeeper is able to examine the bees and to move the combs as needed.

Probably one-third of all the bees in the United States are in hives without movable combs, and to assist the owners of such colonies to get them in proper hives this bulletin is prepared. Various methods are given, some one of which will be possible to any beekeeper, so that there is no reason for delay in making the bees productive.

Unless the bees are properly managed after transfer there is little advantage in movable-frame hives. This requires a study of beekeeping as well as promptness and care. Directions for handling bees are given in other publications of the department.

TRANSFERRING BEES TO MODERN HIVES.

CONTENTS.

ADVANTAGES OF MOVABLE-FRAME HIVES.

HUNDREDS OF THOUSANDS of colonies of bees, representing about one-third of the bees kept in the United States, are housed in log "gums" and in box-hives and produce for their owners an insignificant amount of honey compared with what they might be made to produce if they were transferred into movable-frame hives and handled by improved methods. Following the old-fashioned method of housing bees in log "gums" and box-hives is costing many beekeepers more money than they realize. Much of the honey produced by colonies in box-hives is wasted by crude methods of securing the crop; these colonies are reduced in earning value by uncontrolled swarming, and the annual loss of bees which die in winter because of lack of protection or on account of insufficient winter stores is great. Since the care which is essential to the production of large crops of honey can be given only to those bees which are in movable-frame hives, it is to the advantage of all who have bees in box-hives and "gums" to transfer their bees to movable-frame hives, at the proper season, and make a study of the best methods of beekeeping. These hives should be carefully made. The model, at least, should be a factory-made hive, and the standard 10-frame Langstroth hive is recommended above all others. This may be purchased from any dealer in beekeepers' supplies. If all the beekeepers now using box-hives would do this, they would not only secure more profit from their bees for themselves but would add many millions of pounds to the honey supply of the country.

Transferring, as the word is used by beekeepers, means the removal of a colony of bees, either with or without its combs, from its home in a box-hive or "gum" into a modern movable-frame hive, and there is scarcely any work connected with beekeeping that is more trying than transferring by the old method of cutting the

combs from the old hive and of fitting them into the movable frames of the new hive. If the beginner can successfully transfer a colony from a box-hive in this way he has proved his ability to become a beekeeper. While shorter and easier methods have been devised and this method is not now generally used, there is probably no other operation connected with work among the bees in which there is an equal opportunity for the novice in beekeeping rapidly to obtain useful and necessary information regarding bee activities as in transferring by the old method. In this bulletin the easier methods also are explained.

Bes are wild animals, and man can handle them only in accordance with their natural activities if he wishes them to yield the best returns. The man who understands bee behavior can do almost anything with bees if he tries to make them do only the things it is their nature to do. It should be remembered that, for the man who does not intend to study his bees and give them the proper care, the modern movable-frame hive is no better than the box-hive, and that he who uses movable-frame hives must also study the best methods of modern beekeeping if he would make the business successful. To that end he needs to become familiar with the bee colony, to study the arrangement of combs and brood-nest, and to learn of the queen and her work. This old method of transferring gives an excellent opportunity to obtain first-hand information regarding these natural activities of the bees.

Beekeeping is applied bee behavior and, to a degree rarely seen in other branches of agriculture, success depends on a study of natural activities. Too many beekeepers work by rule of thumb, but the successful beekeeper is a student of bees, adapting his practice to changing seasons and knowing what to expect from his bees under a given set of conditions.

TIME FOR TRANSFERRING.

It is generally stated that the best time for transferring, especially by the old method, is during fruit-bloom, when the combs contain little honey and when the bees will gather nectar rather than rob. Another good time for transferring is immediately after the casting of a prime swarm when the number of bees in the hive is greatly reduced and when there is no danger of losing or injuring the queen, as she will have gone out with the swarm, leaving queencells in the hive. Transferring can, however, be done at any time when there is some nectar being gathered so that the bees will not be inclined to rob, although during a heavy honey-flow the combs will be heavy with honey, which makes them difficult to handle. Some method of transferring can be used successfully at any part of the active season if care is taken to see that the colony does not suffer later from lack

of stores. It is necessary to see that this colony gathers enough honey in time for winter, or that it is fed if need be.

If transferring is attempted at a time when robbers are bad, the work should be done inside a screened or bee-tight building, but the beginner should, if possible, choose a time when the bees are working freely and should work out of doors to avoid trouble from crawling bees. It is usually well to transfer the first few colonies in the late afternoon so that, if robbing does begin, it will stop with night.

METHODS OF TRANSFERRING.

Several methods of transferring are given here, and the beekeeper can choose the one which is best adapted to his plans and conditions. Plan 1 is interesting to one who wishes to study bee behavior but is not well adapted to large operations or to general use.

PLAN 1.—CUTTING THE COMBS FROM THE BOX-HIVE.

By this method the combs are cut out one by one and fitted into the frames of the new hive (see title-page). The bees may all be allowed to remain on the combs, the combs cut from the hive, the bees shaken or brushed into the new hive, and the combs fitted into the frames. It is better, however, first to drive most of the bees from the box-hive into an empty box by drumming and to shake the removed bees in front of the new hive as in hiving a swarm. The combs, thus freed from most of the bees, are then cut out and fitted into the frames. By the latter method there is less danger of killing the queen and less bother from the bees. If the old queen should be seen at any time during the process of transferring, she may be removed and a young queen of good stock introduced, as at this time the bees are so disturbed and disorganized that a new queen is usually readily accepted by the colony.

PREPARATION FOR THE WORK.

Before work is begun, the operator should obtain the tools and equipment necessary so that he may do the transferring quickly and may not be compelled to stop work to get some forgotten necessity. A basin or pail of water is necessary, as the operator should wash the tools and his hands frequently enough to keep them free from honey. The hive must, of course, be ready and each frame should have a thin strip of wood, say, one-half or three-fourths inch wide by about one-eighth inch thick and the full length of the frame, fastened with small nails to the end bars of the frame about halfway between top and bottom on one side of the frame only, so as to support the comb until it is securely fastened into the frame. Vertical strips may be used or the wooden strips may be omitted entirely and the combs may be held in place only by the strings. Wires properly bent so as to snap over top and bottom of frame may also be used or

the beekeeper may exercise his ingenuity in using the materials most easily available. There are also needed tools for opening the hive, such as saw, hammer, and cold chisel. A ball of soft wrapping twine and a heavy butcher knife should be provided as well as two clubs or sticks for drumming on the box-hive. A small box with an opening about the size of, or a little larger than, the bottom of the inverted box-hive is needed, into which to drum the bees, and a large board or a hive cover on which to cut and fit the combs must also be provided.

DRUMMING OUT THE BEES.

On a fine day when many of the bees are out gathering honey, a little smoke should be blown into the entrance of the box-hive or "gum" to induce the bees to fill themselves with honey. The box-hive should now be removed to some quiet place out of the line of flight of the bees and a little distance from them. The new hive, preferably with at least one drawn comb in it, should now be placed on the old stand to receive the returning bees. A little more smoke should be blown into the entrance, the box-hive should be inverted, and the bottom removed, if there is one. The empty box is now placed over the inverted hive with the edges in contact (fig. 1) or, if the box does not fit closely, in contact at the point toward which the combs run. A piece of burlap may be used to cover any open space between the hive and the box, but this is not necessary and is in some degree objectionable, as the operator, when burlap is wrapped around the hive, can not easily see how many bees are passing up into the box or whether the queen goes up with them. It is important that the bees should have a clear runway up the side of the box-hive between the combs and into the empty box, although the box need not fit closely at other points.

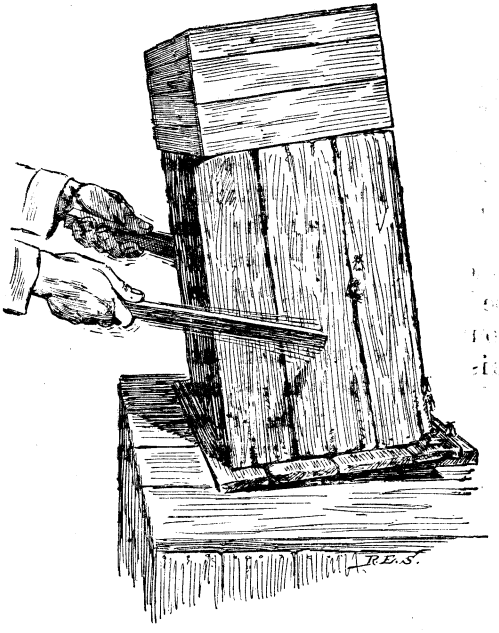

FIG. 1.—Drumming bees from an inverted box-hive.

The two sticks are now used to rap on the sides of the box-hive, hard enough to jar the combs but not so hard as to loosen them. The strokes should be regular and continuous. After a few raps the bees will begin to run upward and the drumming should be continued for

perhaps 10 or 15 minutes, until three-fourths or more of the bees have entered the box on top. These bees may then be thrown in front of the new hive as in hiving a swarm. If the queen is not seen as the bees pass into the hive it will be well to drum more bees from the box-hive to avoid losing the queen while cutting out and fitting the combs. Instead of hiving the drummed-out bees immediately, the box containing them may, if desired, be set aside in the shade until the combs have been transferred into the frames and placed in the new hive.

SAVING THE COMBS.

A side of the box-hive or "gum" is now removed or split off to expose the combs, and the combs are cut out one by one and are laid aside until the brood is reached. As soon as possible a frame should be filled with comb containing brood and placed in the hive unless one has already been given. To fit comb into a frame, a large piece of comb is laid flat on the cutting board and the frame placed loosely on top. The outline of the inside of the frame is marked on the comb with the point of a knife and, after the frame is set aside, the comb is cut to fit tightly in the frame. Two or more pieces of comb containing brood may be used in one frame, but it is not wise to save small pieces of comb or drone-comb. The comb should fit in the frame snugly so that it will be held closely until fastened by the bees. After the frame is fitted around the comb as it lies on the board, both comb and board are raised to an upright position, the comb being supported on one side by the strip which has been tacked to the frame. The board is now laid aside, and the cord is fastened by giving it a wrap or two around the projecting lug of the top-bar, after which it is wrapped several times lengthwise around the frame and then three or four times around the other way, using enough cord to bind the comb securely in the frame. The cord is tied or fastened by again wrapping it tightly two or three times around the lug of the top-bar. As fast as the frames are filled they should be placed in the hive. No drone-comb should be saved, and it is usually not best to save any worker-comb unless it contains brood. At any rate, only large pieces of regular comb should be selected. Enough combs filled with honey may be saved to meet the immediate needs of the colony. Frames not filled with comb should be filled with full sheets of comb-foundation.

PREVENTING ROBBING.

After transferring is finished, all scraps of comb and wax should be placed in a closed box to be melted up later and everything should be washed clean to prevent robbing. Any good honey may be saved for home use, or it may be placed in a pan and fed back to the bees by placing it in an empty upper story over the brood-combs. When the filling of frames is completed, the "cap" or front board of the

box-hive may be so placed as to make the new hive resemble the old, as the bees may be slightly confused at first by the changed external appearance of their home.

In all this work great care should be taken that bees from other hives do not come to help themselves to honey, or robbing may be started and become serious. If robbing should begin, everything should at once be taken inside a bee-tight house and the transferring should be finished there. All work with bees should then be stopped for the day.

The bees in the new hive will immediately set to work to fasten the combs into the frames, and to cut away the strings and drag them out of the hive. After a few days the beekeeper may remove any remaining strings and may pull off the wooden strips which were tacked to the frames. If any of the combs were not evenly fastened in the frames, they may be pressed into place at this time.

PLAN 2.—DRUMMING OUT AND HIVING ON FULL SHEETS OF COMB-FOUNDATION.

This plan prevents all robbing, requires no cutting and fitting of combs dripping with honey, and all combs are built from full sheets of comb-foundation so that only straight worker combs are obtained, but occasionally the bees swarm out and abandon the new hive unless the queen is caged in the hive or is confined in it by a queentrap at the entrance or by a queen-excluder placed between the bottom board and the hive. The success of this plan depends on getting the queen out of the old hive and into the new.

The box-hive is set a few feet to one side, and a hive with movable frames containing drawn combs or full sheets of comb-foundation is put exactly in its place so that as the field bees return they go at once into the new hive. It is well to put into the new hive a frame containing some eggs and young larvæ from which the bees may rear a queen in case the old queen has been lost; or a new queen may be given the colony if one can be obtained. The box-hive is turned upside down and three-fourths or more of the bees drummed out as in Plan 1. The box-hive containing the brood and enough bees to care for it is then placed, right side up, in a new location, preferably a few feet to the rear of the old stand and with the entrance in the opposite direction. In 21 days all the worker brood will have emerged and possibly a new queen will have been reared. These bees may be drummed out and united with their former hive-mates by allowing them to run in at the entrance. In order that there may be no fighting at this time the bees in the new hive should be well smoked, and it is well to shake the bees off from several combs from the new hive and to allow them to run in with the drummed-out bees. The old hive may now be broken up, any honey saved, and the combs melted. If nectar is not being collected, the newly established colony should be fed.

PLAN 3.—TRANSFERRING IMMEDIATELY AFTER SWARMING.

Transferring may be done immediately after a swarm issues from the box-hive. While the swarm is still in the air or clustered, the box-hive is removed to a new location a few feet from the old stand as in Plan 2. The swarm is then placed in a new hive with movable frames on the old stand and its population is further increased by the returning field bees. After 21 days the bees which have emerged from the brood in the box-hive are united with the bees in the new hive by drumming out and uniting as described in Plan 1 and the old box-hive is then broken up.

FIG. 2.—Construction of transfer-tube shown in figure 3.

Instead of this second drive after 21 days, the box-hive may be set, three or four days after it has swarmed, with its entrance close to the new one and a bee-escape placed in the entrance of the old hive so

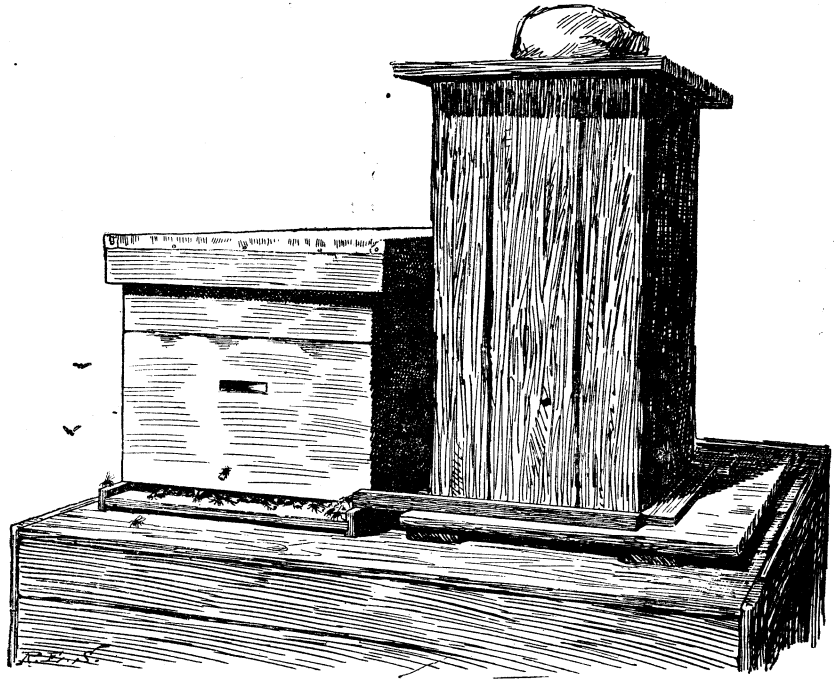

FIG. 3.—Transferring bees by means of transfer-tube.

that the young bees as they come out to fly can not return but must go into the new hive and add to its numbers.

THE USE OF A TRANSFER-TUBE.

Instead of using a bee-escape, the entrance to the box-hive may be closed by a wooden transfer-tube (fig. 2), with the opening of the tube at the entrance of the new hive (fig. 3). Nearly all the emerging

bees will enter the new hive where the queen is, instead of returning through the tube into the old hive. It would be well, as there are few bees in the box-hive, to shade it and to have in it one or more holes covered with wire cloth to avoid the possibility of the combs melting down. In 21 days the box-hive will contain only a few bees, possibly some honey and drone-brood, and it may then be broken up and the combs melted into wax.

PLAN 4.—TRANSFERRING BY PLACING A NEW HIVE OVER THE BOX-HIVE.

Another method, which is in some respects better than the one just given and which is especially useful where much transferring is to be done with a minimum of work, is to place the box-hive with its largest surface uppermost, usually on its side, with the combs on edge so that they will not break down. The bees in the box-hive should be well smoked before the hive is turned on its side, and it should not be moved to another location. What is now the top side of the box-hive should be removed by splitting it into strips one or two inches wide, and these strips should be carefully removed so as to avoid mutilating the combs. The prepared hive containing combs or comb-foundation, at least one comb being used, if possible, is then set on the box-hive over the greatest cluster of bees, and a piece of board placed over any part of the box-hive not covered by the new hive (fig. 4). If any part of the new hive extends over the box-hive, the opening should be closed with a lath or a strip of board. What is now the front of the hive may, unless there is danger of robbing, be left entirely open, and this will cause the bees to work up into the new hive much sooner. If the bees are likely to rob, a board may be set up partly to close the front of the hive.

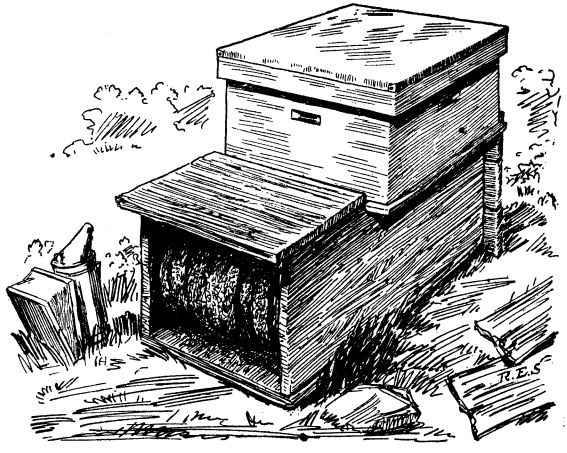

FIG. 4.—Transferring bees by setting hive on top of box.

If the box-hive has no comb in the top (caused by having been robbed the previous season) the space should be filled with straw or shavings, the modern hive set over the part where the comb is, and a board laid over the straw. This will prevent the building of any more comb in the box-hive. If there is some honey in the top of the old hive, the bees will remove it if the cover is pried off, little

by little, several times during the season, until finally it can be removed completely, leaving both ends of the hive open. By this time the bees will have moved all the honey into the new hive, the queen will have established her brood-nest there, and the bees will have transferred themselves. If the beekeeper wishes, he may, after the queen has begun to lay eggs above, put a queen-excluder between the new hive and the old, which will prevent the queen from returning to the box-hive. This usually will not be necessary, as the bees will probably abandon the box-hive as a brood-chamber, since its combs are so much exposed. After the brood has all emerged from the combs in the box-hive the new hive may be placed on the regular bottom-board, the old hive may be broken up, and the combs may be rendered into wax. Supers should be placed on top of the new hive as needed, even while it is on the box-hive, to prevent the bees from returning to the abandoned brood-nest. This plan usually prevents swarming for the season and enables the bees to store the full crop of honey.

PLAN 5.—CATCHING THE SWARM FROM THE BOX-HIVE AUTOMATICALLY.

This method, like the preceding one, takes advantage of the fact that in many sections of the country bees in box-hives and "gums" are almost sure to swarm, and it provides an easy method of transferring for those who may not be familiar with beekeeping work and who do not care to undertake the work of transferring by the usual methods.

PREPARATION OF EQUIPMENT.

The things needed are: (1) A 10-frame hive of Langstroth size, complete with cover, bottom-board, and frames containing full sheets of comb-foundation or drawn combs. It is desirable to have at least one drawn comb in the hive if possible. In the front end of this hive body, near the lower edge, is to be bored a one-half or three-fourths inch hole so placed that a passageway, of a tube of wire cloth or of a bored-out block or of several small pieces of wood, may be placed to connect this hole with the queen-release hole in a queen-and-drone-trap. (2) A wood-wire or wood-zinc queen-excluder. (3) A queen-and-drone-trap.

The cleat is removed from the rear end of the bottom-board, leaving an opening at the rear as well as at the front of the bottom-board. On this bottom-board is placed the queen-excluder, beespace side up, and on this again is placed the prepared hive-body, after the hole has been bored in it as just described.

A queen-and-drone-trap with the queen-release slide drawn out is attached to the front of the hive and a tunnel or tube of wire cloth (fig. 5) or a bored-out block is attached, providing a continuous connection from the queen-release hole in the queen-and-drone-trap to

the hole in the hive-body, so that a queen caught in the trap can return only into the prepared hive-body and will be retained there by the queen-excluder below it.

The colony to be transferred is now set back and the prepared hive is placed so that its entrance occupies the same position as the original entrance to the box-hive. The box-hive is then placed immediately in the rear of the new hive with the entrance close to the rear opening and the space between the two hives is tightly connected so that the only entrance to the box-hive is through the queen-and-drone-trap and over the bottom-board of the prepared hive (fig. 5). All or part of this connection between the two hives may be made of wire cloth to give plenty of ventilation to the box-hive. Great care should be taken to make this connection bee-tight, and it is well to nail laths on each side of the two hives so that they can not become

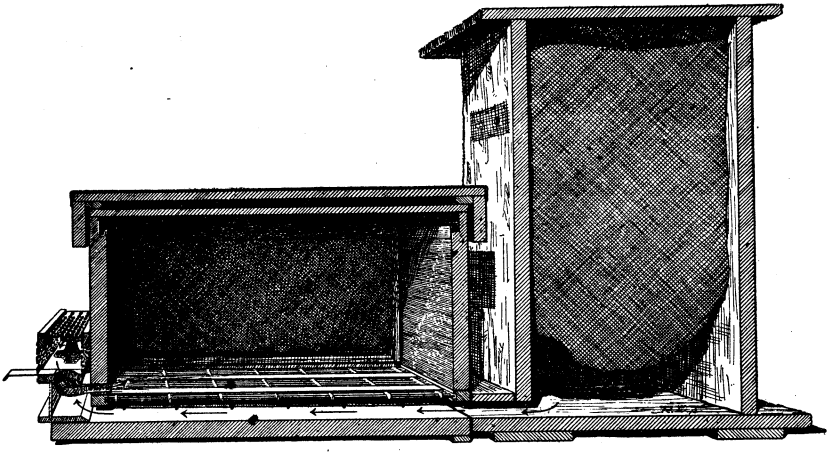

FIG. 5.—Equipment for automatic transferring at swarming time.

accidentally separated. That the hives must be tightly connected so that no queen or bee can escape through a crack and that ventilation must be given so that no bees are smothered are two important items always to be kept in mind.

TRAPPING THE SWARM.

When a swarm issues the queen is caught in the trap and can escape only through the tunnel or hole into the prepared hive and must remain there because of the queen-excluder below it. Here she will be joined by at least a part of the returning swarm, and the old box-hive or "gum" may then be removed and placed beside the new hive with the entrance at right angles to it, the rear cleat of the bottom-board being replaced at this time. All of the field bees will return to the hive through the queen-and-drone-trap as usual, and will remain with the swarm.

The box-hive, the entrance of which should now be provided with a wire-cloth cone or tube bee-escape, as in Plan 3, may now be placed with its entrance close to that of the new hive. As the bees leave the hive through the escape they will enter the new hive and be added to its force. Care should be taken to shade the box-hive and to give it sufficient ventilation, through a hole covered with wire cloth if necessary, so that the combs, deprived of most of the bees, do not melt.

In three weeks all the brood in the box-hive will have emerged, when the hive may be broken up, any honey saved, and the combs melted. The few remaining bees should be shaken from the combs in front of the new hive, any queen found being destroyed or used elsewhere, and the transfer is complete.

Instead of using the bee-escape as above, the bees may be drummed from the box-hive, or the wooden transfer-tube may be used as described in Plan 3 (figs. 2 and 3).

After the box-hive is broken up the queen-and-drone-trap and the queen-excluder may be removed from the new hive and the queen-excluder, if desired, may be placed in its usual position between the brood-chamber and the super, which should be placed on the new hive as soon as needed.

REQUEENING.

In transferring by Plan 5 or by the use of the transfer-tube (Plan 3), it would be well, if the beekeeper can do so, either to buy or to raise queens so that he may requeen at the same time the transferring is done. In that case the new queen may be placed in the prepared hive in the introducing cage and the new and old hives connected up as before described except that a bee-escape is placed in the entrance of the box-hive so that the returning bees can not enter the old hive but must remain with the queen in the new hive. The new queen will soon be released and will begin laying. In two or three weeks the box-hive may be removed and broken up. The bees may be shaken in front of the trap on the new hive in the manner previously described and the queen can then be found in front of the trap and may be killed or, if a good queen, may be caged and used in transferring another colony.

TRANSFERRING FROM HOUSES OR FROM BEE-TREES.

Transferring bees from the walls of a house or from a bee-tree may be accomplished by adapting the methods previously described to the conditions involved.

If the bee-tree is cut down, the shock of the fall may so disorganize the colony that it will offer little or no resistance, and the transferring may be done by cutting out the combs and fitting them

into the frames as described in Plan 1. The same method may be followed if the branch containing the colony is cut off and lowered to the ground.

If a colony of bees in the walls of a house is so situated that a part of the siding or roof can be removed to expose the combs, the transferring may be done as in Plan 1 or, if it is desirable not to damage the house, the bees may be trapped out by the use of a spring bee-escape. An escape can also be made of a wire-cloth cone about 8 inches long, so placed over the entrance that no bees can escape elsewhere than through the small hole in the tip of the cone. This hole should be so small that only one bee can pass at a time. Any other entrances should be securely closed or the operation will be a failure.

A queen with her escort in an introducing cage, or a frame or two of comb with some bees and containing eggs and young larvæ from which the bees can rear a queen, should be placed in the new hive into which the bees are to go after being trapped out of their original home. This new hive should be supported so that its entrance is within a few inches of the original entrance which is now closed by the bee-escape.

The same plan may be used in trapping bees out of a tree if a temporary platform can be built to support a hive near the entrance to the colony. At the end of four or five weeks there will be few or no bees left in the tree or house.

If there are still bees left in the cavity at the end of this time, the beekeeper should then load his smoker with fuel and sulphur, remove the bee-escape, and brimstone what is left of the old colony. If possible the old entrance should be somewhat enlarged to facilitate robbing, and the bees in the hive will then remove all the honey from the old nest in the tree or house, carrying it into their hive on the platform. The old entrance should be securely closed so that another swarm can not enter.

To locate the hive in a desired situation, it may be carried to some place a mile or more distant, left for perhaps a week, and then moved to the permanent stand. In this way the bees lose their memory of the old location and do not return there.

PUBLICATIONS OF THE UNITED STATES DEPARTMENT OF AGRICULTURE RELATING TO BEES.

PUBLICATIONS AVAILABLE FOR FREE DISTRIBUTION BY THE DEPARTMENT.

Treatment of Bee Diseases. (Farmers' Bulletin 442.)
Bees. (Farmers' Bulletin 447.)
Comb Honey. (Farmers' Bulletin 503.)
Honey and Its Use in the Home. (Farmers' Bulletin 653.)
Control of European Foul Brood. (Farmers' Bulletin 975.)
Temperature of Bee Colony. (Department Bulletin 96.)

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Behavior of Honey Bee in Pollen Collecting. (Entomology Bulletin 121.) Price 5 cents.
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Occurrence of Bee Diseases in United States, Preliminary Report (with list of publications of Agricultural Department on Bee Diseases). (Bureau of Entomology Circular 138.) Price 5 cents.
Cause of European Foul Brood. (Bureau of Entomology Circular 157.) Price 5 cents.
Manipulation of Wax Scales of Honey Bee. (Entomology Circular 161.) Price 5 cents.
Sacbrood, a Disease of Bees. (Entomology Circular 169.) Price 5 cents.
Porto Rican Beekeeping. (Porto Rico Agricultural Experiment Station Bulletin 15.) Price 5 cents.
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